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PLANS FOR GRADE LESSONS

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The following plans are the outgrowth of students' work in methods in the University of Cincinnati. They are prepared for the students' own use in their teaching and seem to be of sufficient merit to warrant a somewhat wide circulation. Two ideas are emphasized—the richness of subject-matter and the organization of this material into good thought problems.

RECLAIMING THE SWAMP LAND IN MINNESOTA¹

JEANNETTE C. STONE

(To be taken up after the study of irrigation and in contrast to it, in considering agriculture in the United States.)

Precede study with such arithmetic problems in percentage as the following:

In Tarr and McMurry's *New Geography* (second book), turn to the tables on population (p. 425).

1. Find the percentage of increase in the population of Minnesota during the last 10 years (16 per cent).

2. In the State of Wisconsin in the last 10 years ($12\frac{1}{2}$ per cent).

3. In the State of Ohio in the last 10 years ($13\frac{1}{2}$ per cent).

Let us compare the percentages of the increase in population in these states.

What do the figures show us?

Ans. People are going to Minnesota.

Show Swamp Map of state.

Let us look at this map of the state of Minnesota.

What do you learn about the condition of the land there? (Swamp land.)

How much of the state is covered with the swamps?

Ans. Over two-thirds.

If you were going to farm, then, would you go to Minnesota? Why not?

But let us turn to the map on p. 183.

What do you learn from this map?

What do the statistics show?

Ans. Minnesota is the state leading in the production of wheat.

Turn to page 402.

¹This plan is accompanied by an interesting collection of pictures and newspaper items which unfortunately cannot be adequately reproduced—ED.

What part of the supply of wheat raised in the United States comes from Minnesota?

Ans. Over 1/10.

Why do you suppose then that so many people have gone to Minnesota?

Ans. To take up wheat-raising.

Aim. Let us find out, then, what conditions exist in Minnesota, which have made it the greatest wheat-producing state in our country.

Name the requirements necessary for the raising of wheat.

Ans. Temperature; Rainfall; Soil.

Take up each topic in turn.

Temperature.—The average temperature in the state of Minnesota is 42°.

Explain what an “average temperature” is, telling that sometimes in the state of Minnesota the temperature goes 26° below zero in the winter and 98° above in summer.

Do the same for the state of Ohio (ave. 52°). How much difference?

Of course this difference in temperature will make some difference in the kind of products raised, but it certainly will not prevent the carrying on of agriculture. We know this fact to be true from the statistics in regard to the amount of wheat raised.

Rainfall.—Turn to p. 214. Find the average rainfall for the state of Minnesota. (20–30 in.) For the state of Ohio (30–40 in.). Compare. Do we have sufficient rainfall in this state for farming?

Ans. More than enough.

Do you think, then, that the rainfall in the State of Minnesota will be sufficient?

We have now determined that the temperature is mild enough for carrying on agriculture and that the rainfall is sufficient.

Soil.—Let us find out if Minnesota has any advantage over other parts of the country in respect to the conditions of the soil.

Turn to the map on p. 8. Read Secs. 3 and 4, “Extent of the Great Glacier and Changes That the Glacier Made.” Also p. 10, (3) “Changes Made upon Our Farming.” Read to find out:

What some of the effects of the work of the Great Glacier were on the state of Minnesota?

How would this benefit the composition of the mold?

After the formation of the lakes and swamps how could the fertility of the soil be increased?

Ans. By decaying animal and vegetable matter.

Knowing then, that the temperature in the state of Minnesota is not too severe for carrying on agriculture, that the rainfall is sufficient, that the soil is fertile, what would be the difficulty in farming?

Ans. Swamps.

Show picture of swamps.

What are some of the difficulties in trying to farm swamp land?

GETTING RID OF THE SWAMPS

The whole question, then, of carrying on agriculture in the state of Minnesota hinged on the project of getting rid of the swamps.

Do you know of any country in Europe that has had a similar problem to meet?

Ans. Holland.

Turn to the top of p. 278.

How did the Hollanders meet this problem?

Ans. Dikes and drainage ditches.

What advantage has the position of the state of Minnesota over that of Holland?

Ans. No surrounding ocean, therefore no need of dikes.

MEANS OF ACCOMPLISHMENT

If the state of Minnesota has been made more fit for carrying on agriculture how has this condition been accomplished?

Ans. By building drainage ditches.

Who would be interested in the building of these ditches?

Ans. Land-owners, counties and state.

Very often large sections of the land were wholly uninhabited, as much sometimes as a whole county. In such a case no one cared for the land, for it was unfit for use.

Would anyone be very interested in improving it?

As the population of the state increased, however, much of this swamp land was investigated and in 1886 one of the judges of the state by an open letter, published in the newspapers, called the attention of the public to the condition of the land and the opportunities which it offered for improvement.

So, for an example, let us take Marshall and Beltrami counties, shown here on the map, and find out how the building of ditches progressed there. In other counties much the same thing happened.

The richness of this land and the fact that it was capable of being easily well drained was first noticed by a civil engineer or a surveyor, W. R. Hoag, in company with an attorney, William J. Brown, on a trip through that territory in 1900.

What might a civil engineer and a lawyer do toward furthering the building of ditches in these counties?

Suppose the people became interested, could they and would they undertake this plan alone? Why not?

Ans. Cost.

But in the state of Minnesota, as soon as the importance of draining the land was realized, money was set aside for this purpose by the state.

Why would the legislators think it an important thing to improve the land?

Ans. Get people to come there.

How could the lawyer help the people in these counties under these conditions?

Ans. Advising them in securing the improvement, drawing up petitions, etc.

This was what happened in these counties. The people drew up a petition, with Mr. Brown's help. This petition was presented to the legislature and the money finally granted for the building of certain ditches, which Mr. Hoag, the civil engineer, had planned. The United States government has also recently made such appropriations.

BUILDING OF THE DITCHES

What are some of the things you would like to know about the building of these ditches?

Ans. Width, length, depth, shape. Process of building, etc., what becomes of the water drained off, cost.

PROCESS OF BUILDING

From what you already know about the condition of swamp lands, that is, the fact that they contain stagnant pools of water, rank with vegetation etc., what do you think would be some of the dangers of such an undertaking to the workmen?

Ans. Sinking in the mud. Mosquitoes.

It certainly would be difficult for surveyors to get around without sinking in the mud, for their work takes them everywhere. Can you think of a way by which they might avoid sinking in the mud?

Ans. Use of stilts.

Their instruments are even set on stilts.

Why wouldn't you expect to find mosquitoes in Minnesota?

Ans. Too cold.

But strange to say in spite of the cold, the mosquito pest is perhaps the most disagreeable thing about the whole state. The mosquitoes are hatched in the latter part of the summer in large numbers. So great that the people cannot even sit out on their porches unless they are screened. Fortunately the pest lasts only about a month.

What advantage could the workmen take of this?

Ans. Work where there are none.

From this standpoint, what will be one of the results derived from draining the land?

Ans. Fewer mosquitoes.

Before actually building the ditch, what would the workmen have to know?

Ans. Where to build it.

The civil engineers or the surveyors determine this part of the work.

Draw diagram on board (p. 175).

From this diagram, if you were the engineer, where would you plan to run the ditches? Why?

Ans. Outlet to carry away water drained.

But suppose the river isn't wide and deep enough to carry away all the water drained off. What would happen?

Ans. Water would spread over the land.

That is exactly what did happen.

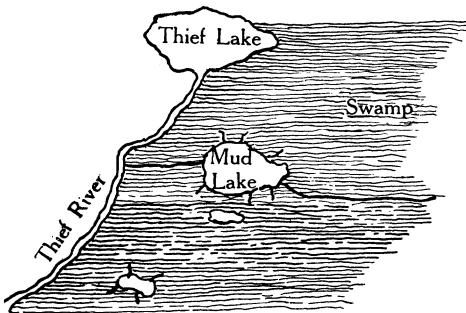
How could this condition be remedied?

Ans. Deepen the river channel.

And that is exactly what they did do. They deepened Thief River by means of dredges.

How many have seen the dredge-boats along the Ohio River? You know then how they would go about this part of the work.

Now we are ready to find out how they were going actually to dig the ditches throughout the counties. You have all seen men digging ditches in the city in laying pipes, repairing sewers, etc.



How do they do it? Why wouldn't this be a good way to dig ditches in Minnesota?

Ans. Too slow. Laborers hard to get. Cost.

Has anyone ever seen ditches dug in any other way?

Ans. By machines.

Show pictures. What advantages would this way of digging ditches have over the other?

Some of these machines are made so that horses or oxen can be used to draw them. Others are propelled by steam engines. These are called "traction engines."

Where do you suppose people would get these machines out in the swamp country?

Ans. Ship them in.

It is an interesting fact to know that some of the best machines shipped there are made in our own state, at Findlay, Ohio.

When this ditch-digger is in operation, as you see in the picture, it heaps up dirt along the side. Can you think of any use that might be made of this?

Ans. Since the side of the ditch is thus made higher than the land around it, it would serve as a splendid road in that country.

What would be the advantage of a road built in this manner?
Let's find out, now, just what building these ditches would mean.

ARITHMETIC PROBLEM

The contract that was let out to Mr. Hoag called for the building of 498 miles of ditches and the building of the same number of miles of highway within 2 years.

One of the first things we have to consider is the length of time the men can work in a year. Why?

1. Suppose the contractor found that the work could be carried on during six months of the year, working 8 hours per day. How much of the ditch and the road must be complete per day in order to finish the contract in the given time?

Ans. $1\frac{2}{5}$ mile.

2. The ditch is 20 ft. wide and 9 ft deep. How much dirt would have to be removed per day? per hour? per min.?

Ans. 1,330,560 cu. ft., 163,820 cu. ft., 274 cu. ft.

3. If one ditching machine will remove 18 cu. ft. per min., how many machines will this contractor be required to buy to complete the contract within 2 years?

4. If it takes 3 men to handle one machine and they receive on an average \$2.00 per day, what will be the cost of labor to complete the work?

Ans. \$27,648.

5. If it costs \$2.50 per acre to drain land, and \$20 per acre to irrigate land, find the difference in cost in improving 480 acres of land.

From what you already know about irrigation give reasons for its being so much more expensive.

Besides the fertility of the soil, the climate, the ease of draining the land, etc., there is another reason for so many people coming especially to this part of the country.

At one time much of this land was set aside as an Indian Reservation. Does anyone know what has become of the Indians?

Since there are very few Indians left, they no longer need this land.

What would be the best thing for the government to do with such lands?

The government has opened this land up as homestead land, and as we have already found out, is even assisting in building the ditches.

Can you see how this will in any way affect the settlement of Canada?

Ans. Turn the tide of immigration.

On the whole, how will the improvement of this land benefit the United States?

What effect has the building of the drainage system had on the state of Minnesota?

Ans. Made it the greatest wheat-producing state in the Union.

A LESSON PLAN FOR THE STUDY OF ALASKA

ELMORE C. WALTHER

Aim: In what ways is Alaska a profitable possession of the United States?
What interested the Russians in Alaska?

Why should the fur industry interest the Russians more than the Americans?

What must the Russians do in order to prevent the Canadians from taking furs on Russian territory?

Would this be worth while?

At what other disadvantages would Russia be in protecting this great strip of territory?

What other countries, besides Russia, would make inroads on the fur resources of Alaska?

What effect would this have on the present industry? in the future?

What must the United States do in order to protect this industry?

Suggest some plan to accomplish this. Read text, p. 150 (Sealing)¹; read *R.C.G.*, §218.

Would this industry alone pay the United States to keep this vast territory?

What, then, must we do in order to make Alaska worth while? (Develop the resources.)

FISHING

Why would this industry be the easiest to develop?

What physical conditions would make the fish of Alaska desirable?

Why would they be easy to catch?

Where would they be more abundant, in the open sea, or near the shore? (Reasons.)

Make an outline map of Alaska. Show the extent of the 100-fathom and 200-fathom depths. Locate the places where the different fish abound. Use *R.C.G.*, p. 211; text, p. 188.

During what season are salmon most easily caught? How and where? (Teacher add information.)

What reasons can you give for locating the fish canneries in Alaska?

Where in Alaska, would you locate them so as to be easily operated in the spring? Draw conclusion after studying (a) Isothermal charts, text, pp. 225 and 226; (b) Ocean current charts, text, p. 220.

COAL AND LUMBER

What would we need in order to establish a fish cannery in Alaska? (1) Machinery; (2) Fishing Craft; (3) Fuel.

What material would be most easily accessible for fuel?

¹ Abbreviations: Text used: Tarr and McMurry, Second Book; *R.C.G.* = *Robinson's Commercial Geography*. Material for Reports can be obtained from recent articles on Alaska in: *The Review of Reviews*, *The Outlook*, *The Technical World*.

Would it be wise to continue to use timber for fuel?

To what extent could Alaska furnish her home industries with fuel? (Report: "The Coal Resources of Alaska").

AGRICULTURAL POSSIBILITIES

Where would most of the fish canned in Alaska be sold?

Look up the population of Alaska and compare with U.S.; Ohio; Hamilton Co.; Cincinnati; text, p. 424; p. 30, Appendix.

Would any be sold in Alaska? (Reasons.)

Do you think that Alaska will be a future for the fishing industry?

Upon what food do you think the Alaskans will live, besides fish? (text, p. 152).

Where could vegetables be raised in Alaska? Determine from rainfall map, p. 213 (text); isothermal charts, pp. 225 and 226 (text).

To whom would you sell this garden truck?

What other crops could you raise?

MINERAL RESOURCES

What industry would the remainder of the people be engaged in? (text, p. 151).

What has been responsible for the rapid development of that country? (Report: "Gold Mining in Alaska," the "Copper Resources of Alaska," the "Tin Resources of Alaska").

Would it be advisable to invest much money in farm lands in Alaska as yet? (Read last ¶ of text, p. 152.)

What kinds of people would you expect to find in Alaska? (Races of Mankind chart; text, Fig. 329).

Which of the races is most responsible for the development of that country?

Of what advantage would it be to Uncle Sam to educate these people? (Report: The Awakening of Alaska).

Summary: In what way has Secretary W. H. Seward shown himself to be a far-sighted statesman when he said: "The Pacific Ocean, its shores, its islands, and the vast region beyond will become the chief theater of events in the world's great hereafter"?

Test: Write an account suitable for a railroad folder, making Alaska as attractive as possible for: (a) The tourist, (b) The farmer, (c) The stock-raiser, (d) The prospector, (e) The miner and promoter, (f) The hunter.

Indicate (or cut out and paste in your account) the pictures that you would use to illustrate this folder.

For what railroad line would you make this folder?

A TEST IN GEOGRAPHY AT CLOSE OF STUDY OF AFRICA

FREDERICK D. COTTER

This set of examination questions is prepared with the idea that an examination should test primarily a child's ability to use the facts which he has acquired; that in the examination itself there should be growth along this line; and that knowledge should also be increased.

Children are to be allowed to use geographies and any other books from which they may gather information. They are not to communicate with each other or receive any help from the teacher.

A certain wealthy Englishman named Cecil Rhodes had become interested in Africa. He had done much to develop the country and now was in the Southern Park in the Transvaal. It occurred to him that a railroad from Cairo in the north to Cape Town in the south would do more to help out his idea of developing Africa, than anything else. What arguments would he use to induce people to invest their money in this scheme (use books). Suggest a good name for this railroad. Use your maps and decide the best route for this railroad. Give four or five good reasons for the route you selected. Trace on the blank map of Africa the route you selected.

What difficulties would be met with in this undertaking with regard to labor? (a) Where would they get unskilled laborers? Why? (b) Where would they get the skilled workers (engineers, superintendent)? What are the dangers to health of the workers? How would they be overcome?

Where would the material for the construction of the road probably be obtained? Why? What would be the cost per mile of building this railroad compared with the cost per mile in the United States? Give one or two reasons for this. Where would they obtain their rolling stock? What fuel would they use? Why? Where would they get it? Would there be more passenger or freight trains? Why? What would be the occupations of the people who traveled on this road? What would the principal articles of freight be (a) from the coast to the interior of the land; (b) from the interior to the coast?

Effect of this railroad.

Name four or five results on the continent.

Give four or five ways in which this railroad would benefit England. In what countries would there be magazine and newspaper articles about this railroad?

Think about whether this project would have any effect on the United States.